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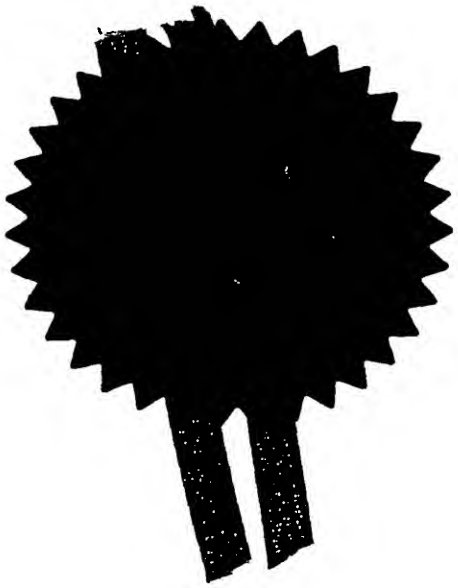

Signed Stephen Hurdley

Dated 13 August 2004

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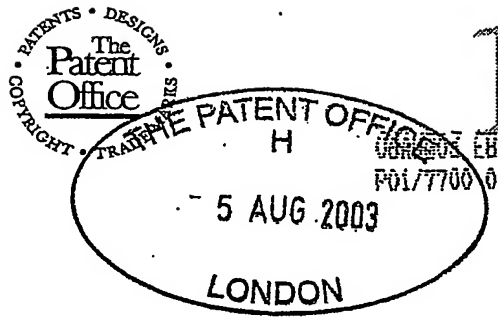

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P01/7700 0.00-0318326.6

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference — P04041GB

2. Patent application number *(The Patent Office will fill in this part)* — 0318326.6 — 5 AUG 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)* — **David Choon Sen LAM**

   73 Gordon Avenue
   Stanmore
   Middlesex
   HA7 3QR

   Patents ADP number *(if you know it)* — 8293755001

   If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention — **Transporting**

5. Name of your agent *(if you have one)*

   "Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)* — LAURENCE SHAW & ASSOCIATES
   10th Floor, Metropolitan House
   1 Hagley Road, Edgbaston
   Birmingham B16 8TG

   Patents ADP number *(if you know it)* — ~~13623001~~ 13623002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*
   a) any applicant named in part 3 is not an inventor, or
   b) there is an inventor who is not named as an applicant, or
   c) any named applicant is a corporate body.
   See note (d))

   No

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9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	6
Claim(s)	0
Abstract	0
Drawing(s)	0

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature Laurence Shaw & Associates Date 05 August 2003

LAURENCE SHAW & ASSOCIATES

12. Name and daytime telephone number of person to contact in the United Kingdom — Dr. Christopher Moore — 0121 454 4962

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Agent's Ref: P04041GB

Transporting

This invention relates to transporting goods, for example rubber, particularly, but not exclusively to transporting goods which can alter their state during transportation to become unusable or such that they require processing after transportation to make the goods usable.

Rubber is produced by tapping the latex of the tree *Hevea brasiliensis*. The latex flows into a collection cup from the tapped tree from where it is passed to a pan where it coagulates to form a cake. Water is rolled or pressed from the cake to provide a dewatered cake of fresh rubber which has the consistency of plasticene.

The cake, which may be called semi-processed rubber, is then transported to the end users for further processing such as cleaning and drying in oven. Further processes may be used to provide rubber having the technical characteristics necessary for, say, vehicle tyre production and to so form the rubber into the end product.

Originally, the latex was harvested from wild trees in South America, although today over 90% of the world's natural rubber comes from plantations of rubber trees in South East Asia. Many end users of natural rubber are located in the United States of America, Japan and Europe. Transportation of rubber, by ship, from South East Asia to Europe or the United States will usually take from one month to six weeks.

During such transportation, the rubber cakes cool and harden and crystallisation within the rubber can, and usually does, occur. The rubber is unusable in that state. This process continues or is compounded when the rubber is stored at the destination port in a cold warehouse or factory, before being delivered to the end-user.

Rubber is a known insulator and, therefore, has a low thermal conductivity, *i.e.* it losses and gains heat very slowly. In order to alter the rubber back to its usable state, it is necessary to slowly heat the rubber to about 70 to 72 °C over a period of about one week to ten days. The gentle heating causes the rubber to soften and for the crystals to dissolve.

Clearly, it is inconvenient and expensive for the end user to have to hold ten-day stocks of rubber whilst it is being transformed into a usable form. It is also expensive to complete the transformation. Thus, time and money is wasted in holding and transforming the stocks, extra warehousing space and energy is also required as well as capital investment in the plant and personnel required to complete the transformation.

Accordingly, it is an object of this invention to provide a method of transporting goods such as rubber which will reduce the time and effort required to convert the raw material back into a usable form once it has been delivered.

A first aspect of the invention provides a method of transporting semi-processed rubber, the method comprising locating the semi-processed rubber in a ship and supplying heat to the semi-processed rubber during transit to prevent solidification of, and/or crystallisation in, the semi-processed rubber.

When referring to solidification, it will be understood that what is meant is even partially hardening which would result in the rubber having to be heated at the end of its journey, say by the end-user, to render the semi-processed rubber usable.

Preferably, sufficient heat is supplied to the semi-processed rubber so that it is held at a temperature above 27 °C, most preferably in a range of from 28 to 35 °C, and even more preferably in a range of from 30 to 33 °C. In fact, the desired temperature is 32 °C, although variations within the above-identified ranges are acceptable.

The heat for heating the semi-processed rubber may come from heat re-circulated from the ship engine. The heat may be provided by a heating blanket placed over, under, around or otherwise adjacent the semi-processed rubber. A container, in which the semi-processed rubber is located in the ship, may be a heated container.

Heat may be directed from the engine room using the water which is drawn through the engine to cool it. That water may be directed through the ship to where it may flow through pipes or panels to heat the semi-processed rubber. Other waste heat may also be utilised.

If a blanket or heated container is used only a low current heating element is required as the requisite temperature is only marginally above ambient. Therefore, the energy required to maintain the rubber in its original, semi-processed state is not excessive.

The method may further comprise storing the semi-processed rubber in a covered warehouse or storage facility at a destination port, the warehouse preferably

being maintained at a temperature sufficient to prevent the rubber from solidifying and/or crystallising during storage.

The method may further comprise transporting the semi-processed rubber to an end user in a state which is usable without requiring further heating.

A second aspect of the invention provides a method of supplying semi-processed rubber to an end-user in a usable form, the method comprising tapping latex from a rubber tree, forming a cake, transporting the cake to a local processor for semi-processing and sent to an end user and ensuring that the cake does not harden or that crystals form in the cake during transportation.

A third aspect of the invention provides a method of transporting goods whose state is prone to alter during transportation, the method comprising maintaining the goods at a temperature of from 28 to 35 °C during transportation.

Preferably, the goods are semi-processed rubber.

Preferably, at least part of said transportation takes place on a ship.

In this specification where reference is made to semi-processed rubber, rubber cakes/bales and the like, it will be understood that what is meant is any form of semi-processed rubber which is liable to change its state (*e.g.* to harden or crystals to form therein) when transported.

The invention will now be explained with reference to the accompanying examples.

Example 1

Rubber was tapped from a tree and two cakes were formed, as is well known to the skilled addressee.

The first cake/bale was packed and placed in a shipping container and left for a period of one month at a temperature similar to those found in the holds of ships.

The second cake/bale was placed in an identical container and had a heating blanket placed under and over it. The heating blanket was arranged to keep the rubber at about 32 °C. The heat was supplied for one month.

At the end of the month the cakes/bales were removed from the containers and compared. The first had hardened significantly and there was evidence of crystallisation. It was evident that the rubber would have to be heated to return it to a usable state. The second cake was usable as it was.

Example 2

Rubber which had been tapped, formed into a cake/bale and semi-processed, and the cake/bale stored at a temperature of 32 °C for a month was removed from its container and left in a warehouse for one week, to simulate storage of the cake/bale at a destination port. The warehouse was maintained at an ambient temperature of 24 °C. At the end of the week the rubber cake/bale was examined. The cake was still in a usable condition. Whilst we do not wish to be limited to any particular theory, it is

postulated that due to rubber's low thermal conductivity the rubber retains its heat and therefore does not harden even when left at a lower temperature for a week.

It will be appreciated by the skilled addressee that by ensuring that the rubber cakes/bales are heated to about 32 °C, or maintained at that temperature, rubber may be transported around the world and sent to a user in a usable condition. This obviates the need for pre-processing the rubber before it is used, thereby reducing warehouse costs, capital costs associated with pre-processing of the rubber (*e.g.* heating for a week) and increasing efficiency of the whole operation.

To heat the rubber any suitable means may be used. A particularly advantageous method requires capturing waste heat from the engine of a ship and re-directing that heat to heat the rubber. In one particular embodiment, the cooling water used to cool the engines is pumped around the rubber (or at least the container in which the rubber is located). Waste heat from the engine exhausts may be used.

Other goods may be transported by ship using the same methods.